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Cable Assembly Procurement/Performance Specification

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ABBREVIATIONS AND ACRONYMS

AMS	Alpha Magnetic Spectrometer
CERN	Centro Europeo per la Ricerca Nucleare
INFN	Istituto Nazionale di Fisica Nucleare
ISS	International Space Station
STS	Shuttle Transportation System
QUP	Quantity per Unit Pack
COC	Certificate of Compliance
IPTR	In-Process Test Report
ATR	Acceptance Test Report
PCKL	Packing List
UPILEX	Metallised Substrate
SOW	State Of Work
PO	Purchase Order
TBD	To Be Defined
NAP	Not Applicable
NPR	Not Prescribed
OHSMS	Occupational Health and Safety Management System
PFAR	Production Final Acceptance Report
QMP	Quality Management Plan
PRSP	Product Specification
TML	Total Mass Loss
CVCM	Colletted Volatile Condensed Material
LADDER	Assembly of silicon detectors and readout electronics on a ladder-shaped reinforcement

1. SCOPE

This document defines procurement/performance specifications and then, technical characteristics and manufacturing specifications for the cable assembly. Said cable assemblies are used on silicon tracker subsystem as interconnection between the ladder assembly (front end hybrid) and the readout electronics (TDR). Four different versions are provided for cable assemblies: S-side flight cable, K-side flight cable, saver cable and test cable. S-side and K-side flight cables are employed as flight in-system interconnections during mission phase. Saver cables and test cables are used during testing for the purpose of reducing flight cable operational stress; in particular, those two cables will be used for connecting/disconnecting of electronic parts (see the figure below).

Cable assemblies must be manufactured in an ISO 9002 certified electronic workshop, in standard industrial class place, and respecting prescriptions contained in this document.

Requirements for testing, packing, storage and shipment are here defined too.

2. APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. When this document is used for procurement, including solicitations, or is added to an existing contract, the specific revision levels (including date of revision) of said documents should be specified in the Solicitation/State of Work/Contract or Purchasing Order.

2.1 Governmental

2.1.1 Specifications

Agenzia Spaziale Italiana, ASI

I/006/01/0	Contratto, 30 Gennaio 2001
	Programma AMS
	Sottosistema Tracciatore al Silicio

European Space Agency, ESA

ESA/SCC No. 20500	External Visual Inspection
ESA/SCC No. 20600	Preservation, Packaging and Despatch of SCC Electronic Components
ESA/SCC No. 21300	Terms, Definitions, Abbreviations, Symbols and Units
ESA/SCC No. 24800	Resistance to Solving Marking
ECSS-Q-70-02A	Thermal Vacuum Outgassing Test for the Screening of Space Materials

Military

MIL-C-26074	Coatings, Electronless Nickel, Requirements for
MIL-I-16923	Insulating Compound, Electrical, Embedding, Epoxy
MIL-G-45204	Goldplating, Electrodeposited
MIL-M-24519	Molding Plastics, Electrical, Thermoplastic
MIL-C-83513	Connector, Electrical, Rectangular, Microminiature, Polarized Shell, General Specification for

2.1.2 Standards

John F. Kennedy Space Center (KSC), NASA

KSC-STD-P-0001B	Preparation of Equipment or System Procurement/Performance Specifications, Standard for
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Military

MIL-STD-202	Test Methods for Electronic and Electrical components Parts
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2.1.3 Drawings

Not Applicable.

2.1.4 [Procedures](#)
Not Applicable.

2.1.5 [Publications](#)
[National Aeronautics and Space Administration \(NASA\)](#)
NHB 6000.1 Requirement for Packing, Handling, and Transportation for
Aeronautical and Space System, Equipment, and Associated
Components
KSC-DF-107 DE Technical Documentation Style Guide

2.1.6 [Other Documents](#)
Not Applicable.

2.2 [Non-Governmental](#)

2.2.1 [Specifications](#)
[G & A Engineering s.r.l.](#)
PROC_2K10402_A01 Connector Procurement/Performance Specification
PROC_2K10502_D01 Cable Procurement/Performance Specification

2.2.2 [Standards](#)
Not Applicable.

2.2.3 [Drawings](#)
Not Applicable.

2.2.4 [Procedures](#)
[G & A Engineering s.r.l.](#)
MFGP_2K1602_D01, Cable Assembly Manufacturing Procedure

2.2.5 [Publications](#)
Not Applicable.

2.2.6 [Other Documents](#)
Not Applicable.

3. REQUIREMENTS

In this section are indicated and defined as applicable the minimal requirements that the assemblies must comply with to be considered acceptable.

3.1 Definition

A cable assembly is constituted of a near-coaxial ribbon flat cable, terminated at both ends with 0.050" microminiature single row strip connectors.

Terminations are realized by thermo-compression or equivalent process and are embedded into a sleeve with the purposes of mechanical stiffening the ends and of shielding of the connectors. The sleeve is a metallic part electrically connected to the shield of the cable. The connection between cable and connector is realized by using a FR4 custom substrate.

The outline of the S-type flight cable, composed of 18 wires, is represented in figure 1a. This version is employed in the subsystem for connecting the front end hybrids with the readout electronics, S-side.

The outline of the K-type flight cable, composed of 16 wires, is represented in figure 1b. This version is employed in the subsystem for connecting the front end hybrids with the readout electronics, K-side.

The outline of the saver cable, composed of 26 wires, is represented in figure 2. This version is employed in the subsystem for connecting the front end hybrids with the test cables during testing.

The outline of the test cable, composed of 26 wires, is represented in figure 3. This version is employed in the subsystem for connecting the saver cable with the readout electronics during testing. Connecting/disconnecting operations must then be executed in the saver cable/test cable junction so to reduce to minimum the number of mating cycles for flight connectors.

During manufacturing testing only one mating cycle is allowed.

3.2 Characteristics

3.2.1 Performance Characteristics

Cable assemblies must meet the following performance characteristics, in terms of operative or storage maximum ratings:

a) Dielectric withstanding voltage (DWV):	300Urms	@50HZ
b) Insulation resistance (IR):	≥5000MΩ	
c) Voltage rating (Vr):	90Vrms	coaxial signal to integrated shield
d) Minimum bending radius (Br):	1mm	only one cycle
e) Resistance between sleeves and shield:	Undefined	on both sides

3.2.2 Physical Characteristics

S-type and K-type flight cables are provided in more versions differing only for the length. The length of the flight cables is not greater than 3 meters and is specific for each of the interconnections so to meet the assembly requirements for any of the single ladder. Lengths and respective identification marking are defined in table 1; "tbd" length values for 18 K-type flight cable and for 18 S-type flight cable will be defined in a further revision of this document.

Savers cables are provided in one only version 55.3mm length.

Test cables are provided in one only version 2 meters length.

Cable length is intended referred to the effective length of the cable (from sleeve cable side edge to sleeve cable side edge). Tolerance over length is +/-10mm for flight and test cables and 0/+5mm for saver cable.

Dimensions of S-type flight cable must be in accordance with the outline of figure 1a.

Dimensions of K-type flight cable must be in accordance with the outline of figure 1b.

Dimensions of saver cable must be in accordance with the outline of figure 2.

Dimensions of test cable must be in accordance with the outline of figure 3.

In the following the pin functions for flight, saver and test cables have been shown.

S-type Flight Cable Pin Function

Wire No.	Signal Name	Wire Size
1	Shield	Awg 28 (07/36)
2	Bias	Awg 30 (01)
3	Lgnd	Awg 28 (01)
4	+2VDC	Awg 28 (01)
5	H1	Awg 30 (01)
6	H2	Awg 30 (01)
7	S	Awg 30 (01)
8	SB	Awg 30 (01)
9	-2VDC	Awg 28 (01)
10	Cal	Awg 30 (01)
11	-2VDC	Awg 28 (01)
12	Lgnd (crossing)	Awg 28 (01)
13	Out 1-	Awg 30 (01)
14	Out 1+	Awg 30 (01)
15	Lgnd (crossing)	Awg 28 (01)
16	Out 2-	Awg 30 (01)
17	Out 2+	Awg 30 (01)
18	Shield	Awg 28 (07/36)

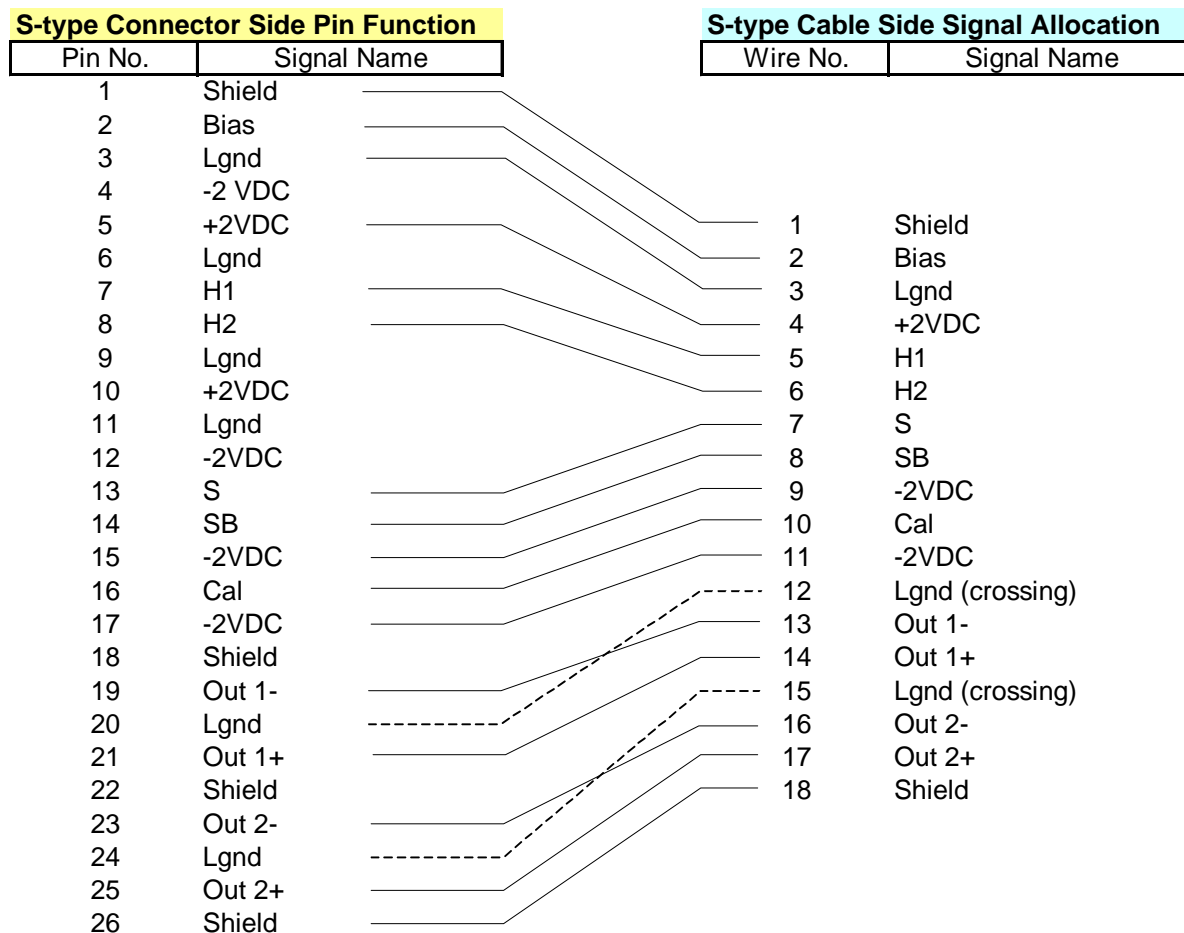
Saver and Test Cable Pin Function

Wire No.	Signal Name	Wire Size
1	Shield	Awg 28 (07/36)
2	Bias	Awg 30 (01)
3	Lgnd	Awg 30 (01)
4	-2 VDC	Awg 30 (01)
5	+2VDC	Awg 30 (01)
6	Lgnd	Awg 30 (01)
7	H1	Awg 30 (01)
8	H2	Awg 30 (01)
9	Lgnd	Awg 30 (01)
10	+2VDC	Awg 30 (01)
11	Lgnd	Awg 30 (01)
12	-2VDC	Awg 30 (01)
13	S	Awg 30 (01)
14	SB	Awg 30 (01)
15	-2VDC	Awg 30 (01)
16	Cal	Awg 30 (01)
17	-2VDC	Awg 30 (01)
18	Shield	Awg 28 (07/36)
19	Out 1-	Awg 30 (01)
20	Lgnd	Awg 30 (01)
21	Out 1+	Awg 30 (01)
22	Shield	Awg 28 (07/36)
23	Out 2-	Awg 30 (01)
24	Lgnd	Awg 30 (01)
25	Out 2+	Awg 30 (01)
26	Shield	Awg 28 (07/36)

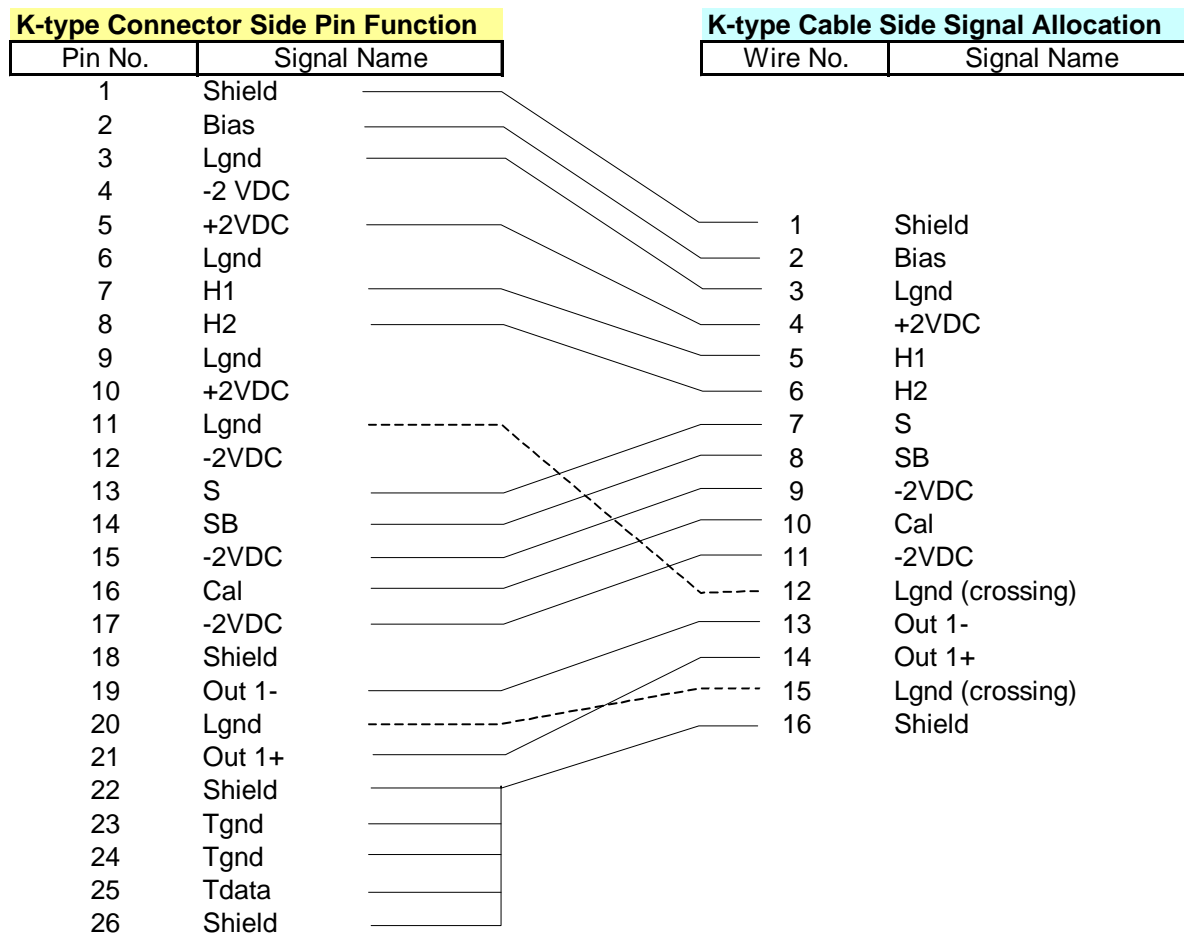
K-type Flight Cable Pin Function

Wire No.	Signal Name	Wire Size
1	Shield	Awg 28 (07/36)
2	Bias	Awg 30 (01)
3	Lgnd	Awg 28 (01)
4	+2VDC	Awg 28 (01)
5	H1	Awg 30 (01)
6	H2	Awg 30 (01)
7	S	Awg 30 (01)
8	SB	Awg 30 (01)
9	-2VDC	Awg 28 (01)
10	Cal	Awg 30 (01)
11	-2VDC	Awg 28 (01)
12	Lgnd (crossing)	Awg 28 (01)
13	Out 1-	Awg 30 (01)
14	Out 1+	Awg 30 (01)
15	Lgnd (crossing)	Awg 28 (01)
16	Shield	Awg 28 (07/36)

For the S-type Flight Cable the pcb logical connections between TDR/Hybrid connector side and cable side are the following:



For the K-type Flight Cable the pcb logical connections between TDR/Hybrid connector side and cable side are the following:



3.2.3 Reliability

NPR.

3.2.4 Maintainability

NPR.

3.2.5 Environmental Conditions

Following environmental conditions, intended as maximum ratings, must be respected:

- | | | |
|---------------------------------|---------------------|-------------------------|
| a) Operating temperature (Top): | from -40°C to +85°C | cable assembly |
| b) Storage temperature (Tstg): | from -40°C to +70°C | for ambient Environment |

3.2.6 Transportability

The cable assemblies must be transported exclusively in the packing prescribed. The shipment must comply with standard procedures applied by common international carriers. The shipment must be covered by a specific insurance against total or partial damage or loss, for the nominal value of the contract.

3.3 Design and Construction

For requirements not covered by this document, manufacturer standard procedures are applicable. ISO 9002 requirements and prescriptions must be applied.

Design is intended completed. This document addresses only manufacturing.

Manufacturing of cables must be in accordance with the procedure MFGP_2K1602_D01, Cable Assembly Manufacturing Procedure.

3.3.1 Materials, Parts and Processes

S-type flight cable

S-type flight cables are composed by:

- a) CONC_1210262_ED8, 26 pin receptacle microminiature single raw strip connectors (manufacturer p/n MA-121-026-245-0000-ED8)
- b) CBWR_18FLT01_001, 18 wires near-coaxial ribbon flat cable (manufacturer p/n TBD), described in Cable Procurement/Performance Specification Code PROC_2K10502_D01, Rev.D of August 29, 2002, Section 2.
- c) MCMP_1310262_001, sleeve type 3
- d) PCBM_2K21007_A01 and PCBM_2K21007_A02, two fr4 substrates.

The sleeve type 3 respects the following dimensions: 41.85mm wide, 10.3mm depth, 2.8mm height. Sleeve base material is Aluminium Alloy type Avional 2024T351 (UNI9002/4) electronless nickel plated per MIL-C-26074.

K-type flight cable

K-type flight cables are composed by:

- e) CONC_1210262_ED8, 26 pin receptacle microminiature single raw strip connectors (manufacturer p/n MA-121-026-245-0000-ED8)
- f) CBWR_16FLT01_001, 16 wires near-coaxial ribbon flat cable (manufacturer p/n TBD), described in Cable Procurement/Performance Specification Code PROC_2K10502_D01, Rev.D of August 29, 2002, Section 3.
- g) MCMP_1410262_001, sleeve type 4
- h) PCBM_2K22908_A01 and PCBM_2K22908_A02, two fr4 substrates.

The sleeve type 4 respects the following dimensions: 41.85mm wide, 10.3mm depth, 2.8mm height. Sleeve base material is Aluminium Alloy type Avional 2024T351 (UNI9002/4) electronless nickel plated per MIL-C-26074.

Saver cable

Saver cables are composed by:

- a) CONC_1210262_ED8, 26 pin receptacle microminiature single raw strip connector (manufacturer p/n MA-121-026-245-0000-ED8)
- b) CONC_1110261_FG4, 26 pin plug microminiature single raw strip connector (manufacturer p/n MA-111-026-145-0000-FG4) , described in Cable Procurement/Performance Specification Code PROC_2K10502_C01, Rev.C of July 10, 2001, Section 1.
- c) CBWR_26FLT01_001, 26 wires near-coaxial ribbon flat cable (manufacturer p/n GSC-06-6420-00)
- d) MCMP_1210262_001, sleeve type 1
- e) MCMP_1110261_001, sleeve type 2
- f) PCBM_2K10602_A01, fr4 substrate.

The sleeve type 1 must respect the following dimensions: 41.85mm wide, 10.3mm depth, 2.8mm height.

The sleeve type 2 must respect the following dimensions: 43mm wide, 14.4mm depth, 2.8mm height.

Sleeve base material is Aluminium Alloy type Avional 2024T351 (UNI9002/4) electronless nickel plated per MIL-C-26074.

Test cable

Test cables are composed by:

- a) CONC_1210262_ED8, 26 pin receptacle microminiature single raw strip connectors (manufacturer p/n MA-121-026-245-0000-ED8)
- b) CBWR_26FLT01_001, 26 wires near-coaxial ribbon flat cable (manufacturer p/n GSC-06-6420-00) , described in Cable Procurement/Performance Specification Code PROC_2K10502_C01, Rev.C of July 10, 2001, Section 1.
- c) MCMP_1210262_001, sleeve type 1
- d) PCBM_2K10602_A01, fr4 substrate.

The sleeve type 1 respects the following dimensions: 41.85mm wide, 10.3mm depth, 2.8mm height.

Sleeve base material is Aluminium Alloy type Avional 2024T351 (UNI9002/4) electronless nickel plated per MIL-C-26074.

3.3.1.1 Toxic Products

The product itself does not contain nor produces toxic or contaminant substances.

During manufacturing process should be applied ISO 14001 requirements and prescriptions.

3.3.1.2 Parts

Employment of the standard parts described in the following G & A Engineering documents is foreseen:

- a) PROC_2K10402_A01, Connector Procurement/Performance Specification
- b) PROC_2K10502_D01, Cable Procurement/Performance Specification, Section 2, for S-type flight Cables
- c) PROC_2K10502_D01, Cable Procurement/Performance Specification, Section 3, for K-type flight Cables
- d) PROC_2K10502_C01, Cable Procurement/Performance Specification, Section 1, for Saver Cables and Test Cables

3.3.2 Electromagnetic Interference

NPR.

3.3.3 Nameplates and Product Markings

Products must be named in accordance to the following coding (see table 1):

Description	Purchase code (p/n)
-------------	---------------------

flight cable K_side	2K10602_FK1-A02xxxx
flight cable S_side	2K10602_FS1-A02xxxx
saver cable K_side	2K10602_SK1-A010055
saver cable S_side	2K10602_SS1-A010055
test cable	2K10602_T01-A012000

Cable marking must be in accordance with the following coding (see table 1):

Description	Marking code	Marking colour
flight cable for K_side	0602AFK-xxxx	Red
flight cable for S_side	0602AFS-xxxx	Blue
saver cable for K_side	0602ASK-0055	Red
saver cable for S_side	0602ASS-0055	Blu
test cable	0602AT0-2000	Black

The sub-code xxxx identifies the length in mm for each type of cable assembly.

Cables must be marked in the sleeve zone as represented in figures 1a, 1b, 2 and 3. The pin #1 of each cable assembly is identified by the white stripe located on the side of the flat cable. The marking shall withstand to the solvent test as specified in ESA SCC 24800.

3.3.4 Workmanship

Products must be free of manufacturing defects. Manufacturing must be in accordance with ISO 9002 prescriptions. Testing, inspections and quality verifications traceability must be assured and the documentation not included in the shipping must be available on request.

3.3.5 Interchangeability

The cable assemblies, object of this specification, must be interchangeable.

3.3.6 Safety

Not prescribed for product. Manufacturer must apply the OHSMS requirements.

3.3.7 Human Engineering

NAP.

3.3.8 Security

Industrial security prescriptions corresponding to Restricted Level must be applied.

3.3.9 Property Issues

The production executed by means of this specification, including specific tools and equipment developed and/or purchased for testing or characterization, the software and hardware acquired, the results, drawings and all related documentation realized and/or acquired in the ambit of the contract, will be property of Agenzia Spaziale Italiana.

3.4 Documentation

During procurement and manufacture activities the following documents must be issued.

Issued by procurement office:

- purchase order
- in-process test report: record of acceptance tests with reference to p/n and s/n
- acceptance report
- certificate of compliance
- packing list

Issued by manufacturer:

- final inspection report
- certificate of compliance
- packing list

3.5 [Logistics](#)

During manufacturing phases, in particular: incoming and storage of materials, fabrication, testing, packing and outcoming must be applied the standard logistic requirements for a plant certified ISO 9002.

3.6 [Personnel and Training](#)

The personnel involved in the manufacturing process must have the necessary requirements to assure the quality of the product. They must also have been informed about material and product handling prescriptions to be adopted during manufacturing phases. It's manufacturer responsibility to define handling requirements.

3.7 [Major Component Characteristics](#)

Major component characteristics are exposed in the following G & A Engineering specifications:

- a) PROC_2K10402_A01, Connector Procurement/Performance Specification
- b) PROC_2K10502_D01, Cable Procurement/Performance Specification.

3.8 [Precedence](#)

This specification has precedence over applicable documents. Any conflict must be notified in order to achieve a full resolution. Preferably resolved conflicts must be formalized by a revision of this specification.

3.9 [Qualification](#)

The product is considered qualified, after manufacturing and testing, when passing the incoming inspection; the requirements are intended assured by the manufacturer and certified by the final inspection report and by the certificate of compliance.

3.10 [Samples](#)

NPR.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The manufacturer is responsible for the performances and for all of the inspections and tests provided in the manufacturing procedure. The manufacturer may use its own facilities or any external commercial laboratory to assure the good execution of the supplies. The responsible of the procurement reserves the right to perform any of the inspections and tests where such inspections and tests are deemed necessary to ensure supplies and services conform to requirements herein specified.

4.2 Special Tests and Inspections

The following special test are prescribed for *test cables* and for *saver cables*:

a) continuity

The test shall be performed by suitable tester at 100% level of procedure assembly.

Two test connectors (one at each side of the cable assembly) shall be adopted for testing. L.I.F. (Low Insertion Force) are preferred. The pin connection of the test connectors are shown in figure 4 and 5; current limitation of 10mA max has to be used for testing.

Continuity check points (see figure 4):

For signals

Between pin #2 and pin #25 of test connector side B

For grounds (drain wires)

Between test connectors side A and side B, the following pins:

pin 1 side A to pin 1 side B

pin 18 side A to pin 18 side B

pin 22 side A to pin 22 side B

pin 26 side a to pin 26 side B.

b) dielectric withstanding voltage (DWV) test @ – 300Vrms (see figure 5)

The following tests shall be performed on 100% level of procedure assembly and it shall not show any evidence of dielectric failure:

Voltage: 300Vac between adjacent signal contacts
150Vac between signal contacts and ground (shield)

Duration: 60sec

Application Points: between adjacent contacts (B/C)
between shield and all (G/B+C)
signal contacts connected together

Wiring (pin connection): as shown in figure 5.

The following special test are prescribed for *S-type flight cables* only:

a) continuity

The test shall be performed by suitable tester at 100% level of procedure assembly.

Two test connectors (one at each side of the cable assembly) shall be adopted for testing. L.I.F. (Low Insertion Force) are preferred. The pin connection of the test connectors are shown in figure 6 and 7; current limitation of 10mA max has to be used for testing.

Continuity check points (see figure 6):

For signal and power wires

Between pin #2 and pin #25 of test connector side B

For grounds (drain) wires

Between test connectors side A and side B, the following pins:

pin 1 side A to pin 1 side B

pin 26 side A to pin 26 side B

b) dielectric withstanding voltage (DWV) test @ – 300Vrms (see figure 7)

The following tests shall be performed on 100% level of procedure assembly and it shall not show any evidence of dielectric failure:

Voltages: 300Vac between adjacent signal contacts;
150Vac between signal contacts and ground (shield);
Duration: 60sec;
Application Points: 300Vac between adjacent contacts B/C (sw1 and sw3 open, sw2 closed);
150Vac between shield and all G/[B+C] (sw1 and sw3 closed, sw2 open),
signal contacts connected together;
Wiring (pin connection): as shown in figure 7.

The following special test are prescribed for *K-type flight cables* only:

a) continuity

The test shall be performed by suitable tester at 100% level of procedure assembly.

Two test connectors (one at each side of the cable assembly) shall be adopted for testing. L.I.F. (Low Insertion Force) are preferred. The pin connection of the test connectors are shown in figure 8 and 9; current limitation of 10mA max has to be used for testing.

Continuity check points (see figure 8):

For signal and power wires

Between pin #2 and pin #21 of test connector side B

For grounds (drain) wires

Between test connectors side A and side B, the following pins:

pin 1 side A to pin 1 side B
pin 22 side A to pin 22 side B
pin 23 side A to pin 23 side B
pin 24 side A to pin 24 side B
pin 25 side A to pin 25 side B
pin 26 side A to pin 26 side B

b) dielectric withstanding voltage (DWV) test @ – 300Vrms (see figure 9)

The following tests shall be performed on 100% level of procedure assembly and it shall not show any evidence of dielectric failure:

Voltages: 300Vac between adjacent signal contacts;
150Vac between signal contacts and ground (shield);
Duration: 60sec;
Application Points: 300Vac between adjacent contacts B/C (sw1 and sw3 open, sw2 closed);
150Vac between shield and all G/[B+C] (sw1 and sw3 closed, sw2 open),
signal contacts connected together;

Wiring (pin connection): as shown in figure 9.

4.3 Quality Conformance Inspections

According to the requirements contained in this specification and with reference to the prescribed documents shipped from the manufacturer together with the goods, the procurement office must apply the following prescriptions recording results on the “procurement in-process test report”.

- a) verification that “final inspection report” and certificate of compliance are included with the product, ok and date
- b) packing condition visual inspection, ok and date
- c) product visual inspections: no voids are permitted in the potting area; no damage on female/male contact connectors; no indents, scratches or cuttings on cable jacket; physical dimensions; marking inspection, ok and date
- d) incoming of products
- e) moving of products in shipping area, packing and preparation for shipment, ok and date
- f) approval, date and signature

5. PREPARATION FOR DELIVERY

5.1 Preservation and Packaging

The product must be stored in a standard industrial environment with packing of level B.

The product must be protected by the packing of level A for shipment or for storage ante/post shipment.

The following documents must be included into the pack:

For shipment executed by the supplier

- a) final inspection report
- b) certificate of compliance
- c) packing list

For shipment executed by the procurement office

- a) certificate of compliance
- b) packing list

Copy of the Acceptance Report must be attached to the invoice and send to Agenzia Spaziale Italiana.

5.2 Packing

Packing includes two levels:

Level B: sealed ESD envelop, connector pins shall be electrically shortened before packaging by means of suitable conductive material (such condition shall be maintained until final connection to the higher level unit).

Level A: hard cardboard box including auxiliary materials for product protection during transportation.

5.3 Marking for Shipment

The packed product is uniquely identified with appropriate card and label (featuring p/n and s/n) applied on A level packing. The label must contain following information:

for shipments from manufacturer

- a) manufacturer general information
- b) customer shipping data
- c) code of purchase order
- d) code of packing list
- e) product identifier
- f) transport and handling requirements
- g) weight and dimensions of the packing
- h) shipping check [company stamp and date of check]

for shipments from procurement office

- i) general information about G & A Engineering
- j) customer shipping data
- k) recipient shipping data
- l) code of packing list
- m) product identifier
- n) transport and handling requirements
- o) weight and dimensions of the packing
- p) shipping check [company stamp and date of check]

6. NOTES

6.1 Intended Use

Products object of this specification will be used for the fabrication of mechanical structures used in the silicon tracker subsystem of AMS program, phase C/D.

6.2 Ordering data

The purchase order must define general conditions of supply, quantities, deliveries and prices. The purchasing order must refer to this document as integral part of itself and as applicable document.

Supplies are free of VAT and custom fees according to Italian: art.8bis, lettera e) D.P.R. 26/10/1972 numero 633 e successive modificazioni (as certified by Agenzia Spaziale Italiana).

6.3 Use of Documents

This document must be considered confidential for industrial aspects and contains proprietary information and neither the document nor the said proprietary information shall be published, reproduced, copied, or disclosed without the express write permission of a duly authorized representative of one of the subscriber parts.

6.4 Destination of Goods

The products must be shipped from manufacturer to the address of G & A Engineering s.r.l., plant of Oricola AQ – Italy.

Products procured by G & A Engineering s.r.l. must be consigned to Agenzia Spaziale Italiana with place of destination: INFN Sezione di Perugia, Via Pascoli, 06100 Perugia – Italy.

6.5 Further Procurements

The manufacturer commits itself to accept further orders of any volume for a period not inferior to 3 years in compliance of the requirements of this specification.

7. APPENDIX

Not applicable.

Custodian:

G & A Engineering s.r.l.

Località Miole, 100

67063 – ORICOLA, AQ

ITALY

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email: info@gaengineering.com

Tel +39 0863 909003

Fax +39 0863 907616

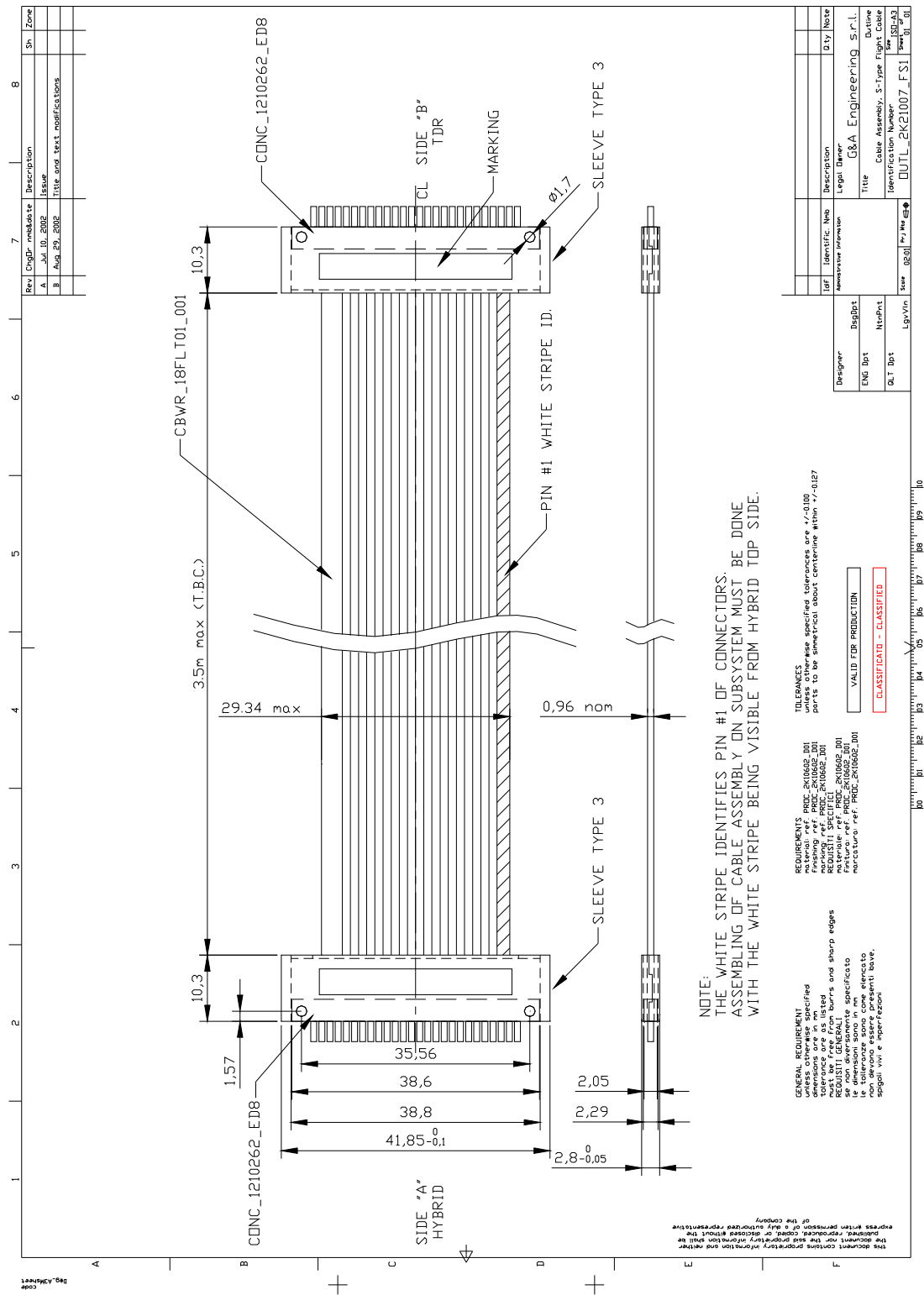
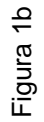


Figura 1a







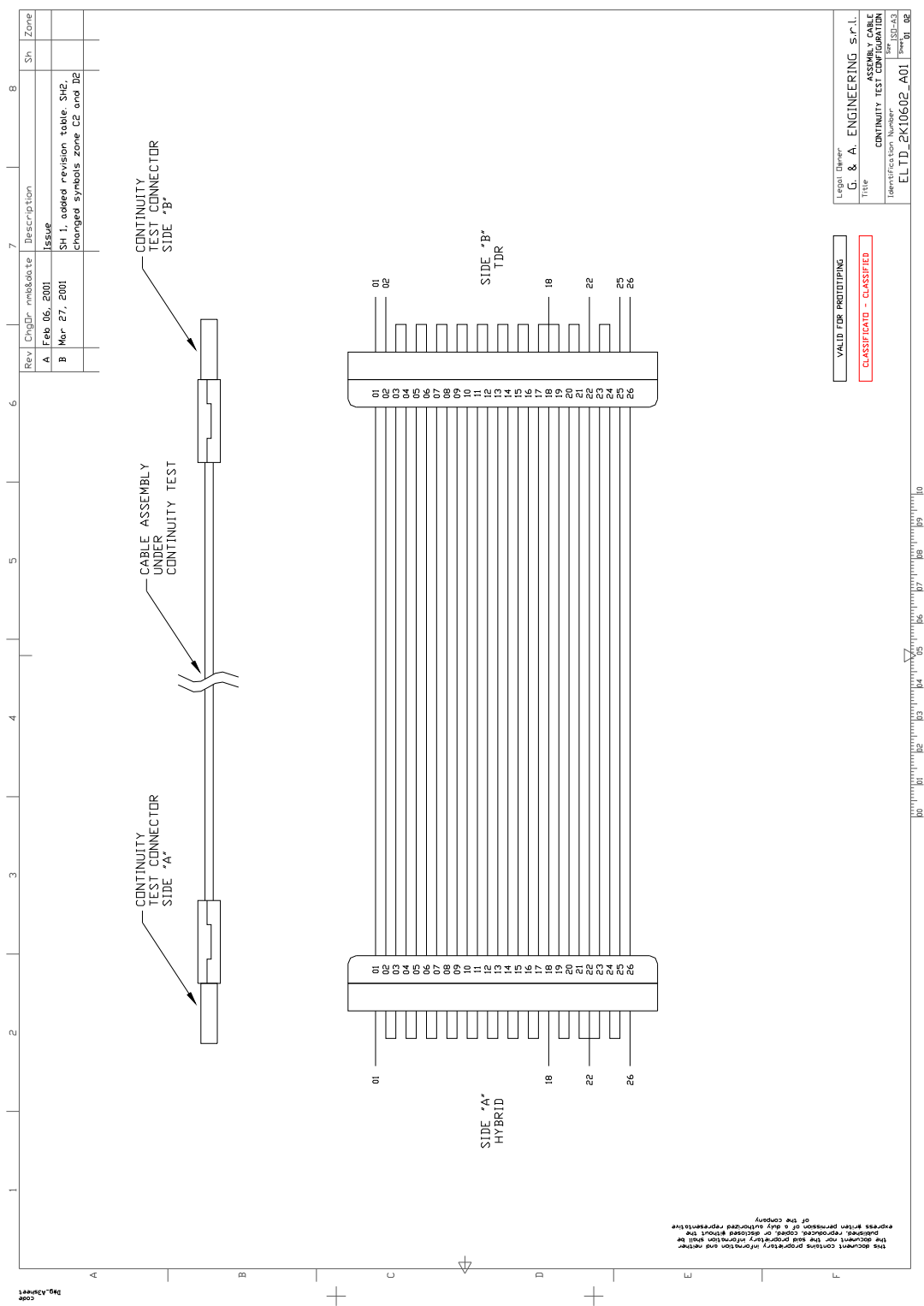


Figure 4

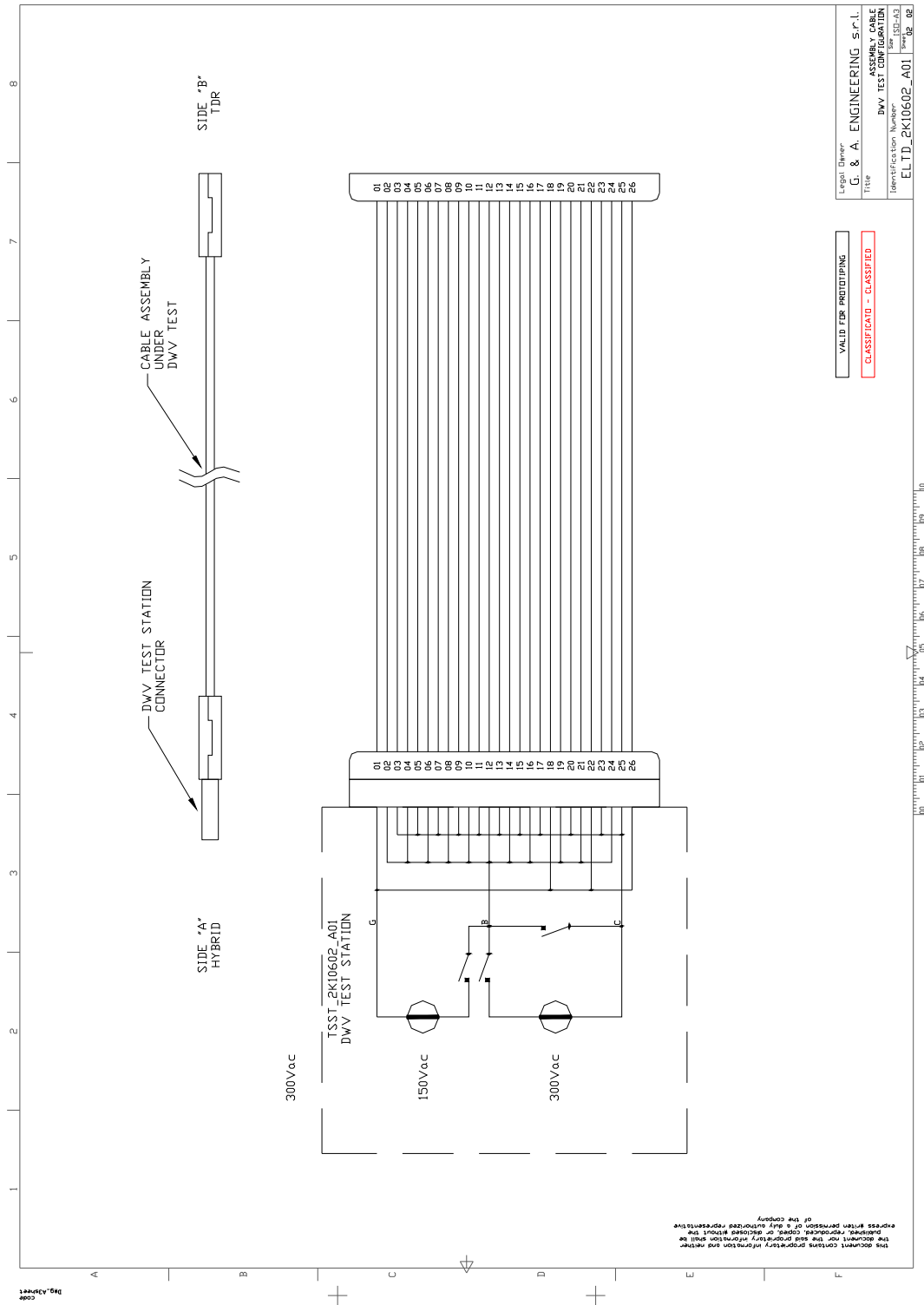
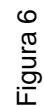


Figura 5



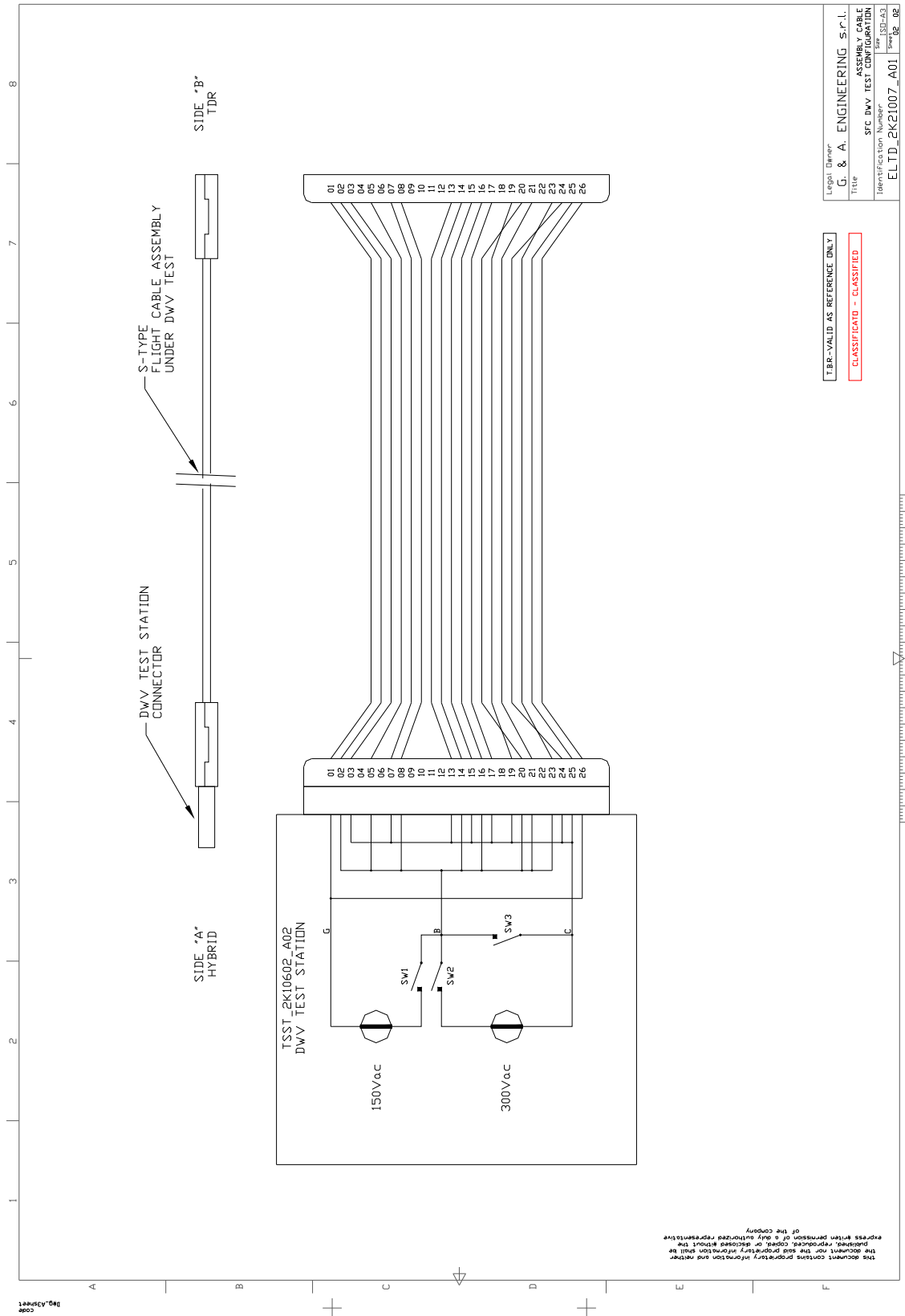
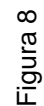


Figura 7



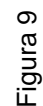


TABLE 1 - CABLE ASSEMBLY CODING

Purchase code (p/n)	Description	Marking code	Length including sleeve [mm]	Length not including sleeve [mm]	Q.ty
2K10602_FK1-A021535	Flight Cable, K	0602AFK-1535	1555.6	1535	4
2K10602_FK1-A021635	Flight Cable, K	0602AFK-1635	1655.6	1635	4
2K10602_FK1-A021695	Flight Cable, K	0602AFK-1695	1715.6	1695	12
2K10602_FK1-A021755	Flight Cable, K	0602AFK-1755	1775.6	1755	8
2K10602_FK1-A021805	Flight Cable, K	0602AFK-1805	1825.6	1805	4
2K10602_FK1-A021905	Flight Cable, K	0602AFK-1905	1925.6	1905	12
2K10602_FK1-A021925	Flight Cable, K	0602AFK-1925	1945.6	1925	8
2K10602_FK1-A021955	Flight Cable, K	0602AFK-1955	1975.6	1955	4
2K10602_FK1-A022065	Flight Cable, K	0602AFK-2065	2085.6	2065	8
2K10602_FK1-A022105	Flight Cable, K	0602AFK-2105	2125.6	2105	4
2K10602_FK1-A022165	Flight Cable, K	0602AFK-2165	2185.6	2165	16
2K10602_FK1-A022195	Flight Cable, K	0602AFK-2195	2215.6	2195	4
2K10602_FK1-A022225	Flight Cable, K	0602AFK-2225	2245.6	2225	12
2K10602_FK1-A022275	Flight Cable, K	0602AFK-2275	2295.6	2275	24
2K10602_FK1-A022335	Flight Cable, K	0602AFK-2335	2355.6	2335	16
2K10602_FK1-A022405	Flight Cable, K	0602AFK-2405	2425.6	2405	16
2K10602_FK1-A022445	Flight Cable, K	0602AFK-2445	2465.6	2445	16
2K10602_FK1-A022535	Flight Cable, K	0602AFK-2535	2555.6	2535	8
2K10602_FK1-A022565	Flight Cable, K	0602AFK-2565	2585.6	2565	8
2K10602_FK1-A022655	Flight Cable, K	0602AFK-2655	2675.6	2655	4
2K10602_FS1-A021580	Flight Cable, S	0602AFS-1580	1600.6	1580	4
2K10602_FS1-A021680	Flight Cable, S	0602AFS-1680	1700.6	1680	4
2K10602_FS1-A021740	Flight Cable, S	0602AFS-1740	1760.6	1740	12
2K10602_FS1-A021800	Flight Cable, S	0602AFS-1800	1820.6	1800	8
2K10602_FS1-A021850	Flight Cable, S	0602AFS-1850	1870.6	1850	4
2K10602_FS1-A021950	Flight Cable, S	0602AFS-1950	1970.6	1950	12
2K10602_FS1-A021970	Flight Cable, S	0602AFS-1970	1990.6	1970	8
2K10602_FS1-A022000	Flight Cable, S	0602AFS-2000	2020.6	2000	4
2K10602_FS1-A022110	Flight Cable, S	0602AFS-2110	2130.6	2110	8
2K10602_FS1-A022150	Flight Cable, S	0602AFS-2150	2170.6	2150	4
2K10602_FS1-A022210	Flight Cable, S	0602AFS-2210	2230.6	2210	16
2K10602_FS1-A022240	Flight Cable, S	0602AFS-2240	2260.6	2240	4
2K10602_FS1-A022270	Flight Cable, S	0602AFS-2270	2290.6	2270	12
2K10602_FS1-A022320	Flight Cable, S	0602AFS-2320	2340.6	2320	24
2K10602_FS1-A022380	Flight Cable, S	0602AFS-2380	2400.6	2380	16
2K10602_FS1-A022450	Flight Cable, S	0602AFS-2450	2470.6	2450	16
2K10602_FS1-A022490	Flight Cable, S	0602AFS-2490	2510.6	2490	16
2K10602_FS1-A022580	Flight Cable, S	0602AFS-2580	2600.6	2580	8
2K10602_FS1-A022610	Flight Cable, S	0602AFS-2610	2630.6	2610	8
2K10602_FS1-A022700	Flight Cable, S	0602AFS-2700	2720.6	2700	4
2K10602_FK1-A02xxxx	Flight Cable, K	0602AFK-xxxx	tbd	tbd	18
2K10602_FS1-A02xxxx	Flight Cable, S	0602AFS-xxxx	tbd	tbd	18
2K10602_SK1-A010055	Saver Cable, K	0602ASK-0055	80	55.3	250
2K10602_SS1-A010055	Saver Cable, S	0602ASS-0055	80	55.3	250
2K10602_T01-A012000	Test Cable	0602AT0-2000	2020.6	2000	20